IOP Conference Series: Materials Science and Engineering 2017 vol.240 N1

Thermal and hydraulic efficiency of the corridor tube bundle in conditions of pulsating flow of fluid

Ilyin V., Sabitov L., Haibullina A., Hayrullin A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. The method of determining the thermal and hydraulic efficiency η of tube bundles with a pulsating flow is given in the paper. Based on numerical simulation, the effect of the Reynolds number Re of the dimensionless pulsation amplitude β and the Strouhal number Sh on the thermal and hydraulic efficiency η of the corridor tube bundles was investigated. The optimum pulsation regimes corresponding to the maximum η are found.

http://dx.doi.org/10.1088/1757-899X/240/1/012025

References

[1] Popov I A, Yakovlev A B, Shelkov A V, Rigkov D V and Obuhova L A 2011 Topical methods of heat transfer intensification for heat transfer equipment of heat power engineering Power engineering of tatarstan 25-29

[2] Fu Wu-Shung and Tong Bao-Hong 2002 Numerical investigation of heat transfer from a heated oscillating cylinder in a cross flow International Journal of Heat and Mass Transfer 45 3033-43

[3] Li Guoneng, Zheng Youqu, Hu Guilin, Zhang Zhiguo and Xu Yousheng 2016 Experimental Study of the Heat Transfer Enhancement from a Circular Cylinder in Laminar Pulsating Cross-flows Heat Transfer Engineering 37 535-44

[4] Neelesh B and Amit K 2017 Pulsating flow and heat transfer analysis around a heated semi-circular cylinder at low and moderate Reynolds numbers Journal of the Brazilian Society of Mechanical Sciences and Engineering Mar 54

[5] Khaibullina A I, Khairullin A R, Sinyavin A A and Ilin V K 2014 Heat transfer at in-line tube bank under low-frequency asymmetrical impulses impact on fluid flow European physical journal 010041-43

[6] Khaibullina A I and Ilyin V K 2014 Experimental investigation of external heat transfer from tube bundle under condition of low-frequency asymmetrical impulses of fluid cross-flow with reynolds numbers ≤ 500 Energy Problems 11-19

[7] Popov I A and Mahyanov H M 2009 Physical basics and manufacture use of heat transfer intensification. Heat transfer intensification (Kazan: Center of innovative technologies) 560

[8] Migai V K 1987 Modeling of heat-exchange power equipment (L.: Energoatomizdat) 264

[9] Nazmeev Yu G and Konakhina I A 2001 Organization of energy technology complexes in the petrochemical industry (M.: Publishing house MPEI) 364

[10] Khaybullina A I, Khayrullin A R and Ilin V K 2016 Heat transfer in the flow channel in tube bundle corridor type under imposed on the flow liquid of upstream low-frequency asymmetrical pulsations Energy Problems 64-75